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The Arboretum Bulletin



Rhododendrons in a Small Garden

E. H. M. Cox*

YOUR editor has asked me to contribute a paper for your ARBORETUM BULLETIN on rhododendrons for a small garden. This has put me in a quandary. It is many years since I visited your Pacific Northwest. I have still a recollection of the high spots, Yellowstone, Mount Shasta, Seattle, and particularly the roses in Portland, but, vivid though it is, I have forgotten what little I knew of your soil and climatic conditions; and both are so important in the successful growing of rhododendrons. I remember vaguely that your climate is, or is supposed to be, like that of the British Isles, but there is more to it than an approximate similarity, prevailing winds, summer moisture, the incidence of spring frosts and so on. In addition, the war has lasted a long time. Many rhododendrons, particularly hybrids, have come to maturity during the war years, but so intent have we been in our war work and so difficult has it been to travel that one only knows what has been going on in one's immediate neighborhood. Living in Scotland, I am very rusty about new developments further south, and that means the south and west of England, a far cry during the war years.

*Mr. E. H. M. Cox is without a doubt one of the foremost horticulturists in Great Britain. His experience with horticultural plants and with horticulturists has been most extensive. At various times he has edited well-known English publications such as "Country Life" and "The New Flora and Silva". As a matter of fact, it was he who founded the latter when it began publication in 1928. He also explored Upper Burma in 1919 in the company of Mr. R. Farrer. He has written extensively on both rhododendrons and primulas and his last effort has been an attempt to gather together information on the history of plant exploration in China.

But certain things do stand out. The twenty years between wars were a period of intensive introduction of new species from the Far East and of hybridizing at home. Luckily, rhododendrons, being creatures of the woodland, were spared, as a rule. They did not suffer the usual fate of herbaceous plants and roses, consignment to the rubbish heap to make way for more food production. And so we have always been able to keep a weather eye open on their performance, to mark those not worth keeping and occasionally to propagate those that were.

We have also been able to learn a great deal about the ultimate size in cultivation of many of the species, and often this is by no means the same as their size in the wild. Finally, our gardens, and gardeners, have been able to digest the great mass of hybrids that have flowered during the last decade. Far too much indiscriminate crossing was done, and probably ninety-five per cent of the resulting hybrids will find no permanent place in our gardens, but among the other five per cent are some magnificent plants, not only equaling in quality most of the species but prolonging the flowering time well into the summer. Probably few, if any, have yet reached your side of the Atlantic, but you should keep a "weather eye" open for the children of *R. discolor*, such as Dorcas, Lady Bessborough, almost the color of a peach, and Goldsworth Orange; and also hybrids of *R. Griersonianum*, such as Tally Ho and Firebird.

In this country we now have such a huge selection that the owner of a small garden can afford to be as choosy as he likes. This will come later in your part of the world, but I hope that what you do import from us is the best, even if you have to wait for it, and not introduced by nurserymen just because they could be picked up at a cheaper price.

This preamble leads up to the point that I am definitely frightened of putting on paper my selection of rhododendrons for a small garden. I know what I would choose after living for twenty-five years among them, but, as I said before, conditions vary so much. I should not grow the large growing species. They take so long to come to flowering size and conditions have to be so exactly right for the real success, that as a background I should have the hardy and old tried favorites that do not mind that little extra sun, or puff of wind, or touch of frost. Plants like Purple Splendor, a deep velvety color that has not been equalled in any of the newer hybrids, that other old favorite *R. fastuosum flore pleno*, the only double rhododendron I have ever liked and such a good lavender-mauve. Of the paler ones my first choice would be Mother of Pearl, that pale blush sport from the old favorite Pink Pearl, and Loder's White, pale pink fading to white. In reds there is a good choice, B. de Bruin, Mars, probably still the best hardy red, or Bagshot Ruby. Slightly smaller-growing are those fine "Dutchmen," the Earl of Athlone and Britannia, both really magnificent reds and very hardy.

If large-growing rhododendrons are planted in a small garden, it is obvious that they must be used as background plants. Hybrids such as those mentioned above will grow into each other and blend. Most large growing species will not: they require space to show off their individualities.

In plants of medium stature, on the other hand, you are on surer ground with species. In the wild state they are usually found in colonies and usually their habit makes them group well. Here again the more limited your ground the more careful you should be in your choice. If it is at all possible beginners should see what they are going to buy in

flower before "making the plunge." Catalogues can be so very misleading. Personally, if I were limited to three rhododendrons of medium size, I should "plump" for *R. yunnanense*, so very quick-growing and free-flowering with its open, many-stamened flowers of pink or white usually spotted with darker color; *R. neriflorum*, sometimes touched with spring frost, but the brightest and richest red-crimson of any rhododendron I know, and *R. Griersonianum* with its more tubular flowers of almost a geranium red. Apart from its very exotic appearance it prolongs the rhododendron flowering season until June, a very great advantage, particularly in a small garden.

It is, however, in the dwarfs that the small garden can really excel. It must be remembered that the dwarf rhododendron is to Western China what our heather is in Scotland: it carpets the moors, and can look equally well as a shapely small specimen or as a dense clump many square yards in extent. The only point I would stipulate is that dwarfs should be gone over with the shears. In cultivation the soil is usually richer and the situation more shady and sheltered from wind than their home in the wilds, with the consequence that they quickly become leggy unless looked after. I know this to my cost. Five years of complete wartime neglect has ruined many of mine. They have to be raised again from cuttings and a fresh start made. They have got too much out of hand.

Here again it is advisable to see what you are buying. Many of the dwarfs vary much in color, and, of course, the best forms can only be increased from cuttings. The best of these dwarfs are certainly those with blue, lavender or purple flowers, such as *R. scintillans*, *R. hippophaeoides*, *R. impeditum*, *R. intricatum* and the biggest of them, *R. ravum*, that reaches a height of almost four feet with deep rose-colored flowers. Almost all are good in their best forms, so there is no need to prolong the list. Also it may be that species introduced to us in the British Isles may not be such good forms as those sent by collectors

(Continued on Page Nineteen)

American Rhododendrons and Azaleas

G. G. NEARING*

TO THE cultivated rhododendron as distinct from the azalea, American species have contributed one all-important quality—hardiness. Nowhere else in the world have large-leaved species learned to endure so well those extremes of climate to which the world's chief centers of modern industrial civilization are subject, and since it was near these centers that the great demand for ornamental shrubs arose, American species were drawn upon to contribute the necessary toughness or constitution. For in hybrids can be expected only those qualities which existed in the original wild parents. Breeding serves merely to re-combine these parental traits in varied assortment.

In spite of all that enthusiasts for native plants may tell us, the American species have contributed little else that was desirable. Millions of wild plants ripped from the mountains are used in what horticulturists call landscape effects, but although these in some cases are more beautiful than would have been the unassisted efforts of nature, they always fall far short of the beauty which could have been achieved if the plant had been chosen for merit alone, without regard to nationalistic prejudice or the saving of money.

Rhododendron catawbiense gives its name to our leading race of hardy hybrids, of which it is one of the parents, and which do resemble it in many respects. Found from Virginia southward, often on the very summits of the Appalachian ridges, 5,000 to 6,000 feet and more above sea level, it makes a wonderful display in May, for there in places it covers large areas almost to the exclusion of other vegetation. The blossoms vary in shade from the prevailing purplish pink to

dull red, rarely to white. A white form obtained from Powell Glass of Virginia, Gable considers one of the finest rhododendrons in his collection. The *Catawbiense* Album of the trade, however, is not a natural variety of this species, but a complex hybrid, and a splendid one.

The form known as *R. catawbiense compactum* comes from the highest and most exposed ranges, where it is considerably dwarfed and very slow-growing, reaching a height of perhaps two feet in 20 years, flowering but little in the early stages. Removed to sea level it is difficult to keep in health. Temperatures of 25 below zero Fahrenheit do not usually injure it, but hot summers may, and it evidently resents any lack of snow.

Larger forms of the species may attain 20 feet, and because they originate at somewhat lower elevations, respond better to cultivation. If a native species must be used, this is the best for most purposes, as the flower heads are of fair size, borne at the summit of the plant before the new growth has gained much length. Yet their varying purplish colors which stand out so brilliantly in the misty air of the mountains, do not blend well in intimate spots. The sun fades them quickly to disagreeable vinous shades.

More planted because it is cheaper is *R. maximum*, native of bogs and damp ravines from southern Canada southward through the mountains to Georgia. The plant grows larger than its relatives, up to 40 feet, sometimes with the trunk a foot in diameter. The rather handsome leaves attain a length of nearly a foot in favorable, shaded situations. When flowering time comes, in late June or early July, the eye accustomed to ornamental hybrids is necessarily disappointed by the rather puny clusters partly hidden among new leaves. Their color, though, is innocuous, white or pale pink. If good hybrids had never been bred, *R. maximum* would make a satisfactory cultivated shrub, but when varieties so much more ornamental are readily obtainable,

*Mr. G. G. Nearing can be regarded as being one of the few real authorities on rhododendrons in the United States. He has studied and worked with them for a long period of years and of particular interest to rhododendron growers in the Northwest was the method of propagation which he and Dr. C. H. Conners of the New Jersey Experiment Station published in 1939. We are most happy to have Mr. Nearing gather together all of his information on the native American rhododendron species and to permit our membership the opportunity and privilege of reading about them.

it is hard to understand why so many persons not poverty-stricken are willing to plant this inferior form. It is, however, fully hardy, native even in Ontario and Nova Scotia, where few of our hybrids can exist.

R. californicum, common over large areas along the Pacific, I have never seen in bloom, because it will not grow in our eastern climate. In some ways intermediate between the two eastern species, to which it is closely related, it seems to make a better display than either, where it can be grown. Yet in those places the magnificent hybrids Loderi, Earl of Athlone, Mars, Purple Splendor, Unique, and a hundred others offer such incomparable competition that *R. californicum* too is best left undespoiled in its native highlands.

Of the smaller, scaly-leaved rhododendrons, America has four species. Three much alike from the southern Appalachians and northern Florida were once lumped under the name *R. punctatum*, the best form of which is now known as *R. carolinianum*, flowering in May with dense clusters of apple-blossom pink partly hiding its bronzy, three-inch leaves, but the color deepening after a day or two to a dull rose, not nearly so attractive. It is extensively planted in the east, where reasonably hardy, with a tendency however to die back after each abundant blooming. Although superior hybrids founded on it may soon appear, there is at present no cultivated plant to take its special place. On the west coast, *R. carolinianum* will probably be surpassed by the best forms of *R. oreotrephes* from China, while *R. yunnanense*, *R. Augustinii* and other members of the Triflorum Series make excellent substitutes of somewhat different character.

R. minus, as treated in books, might seem hard to distinguish from *R. carolinianum*. Both become larger shrubs than one might expect, *R. minus* reaching a dozen feet or so. It makes long annual growths with taper-pointed leaves unlike the blunt ones of the denser *R. carolinianum*, and opens its flowers a month later, in June. These are dull rose from the start, and more or less obscured by the new foliage. It is less useful in cultiva-

tion, though equally hardy. In the west it would compete with *R. rubiginosum* and the *Heliolepis* Series rather than the *Triflorum* Series.

R. Chapmannii, less hardy, confined mostly to the lowlands of western Florida, resembles *R. carolinianum*, but is more open in habit. Its greatest usefulness in cultivation should be for the production of a hybrid race capable of surviving the hot summers of the southern coastal plain, where other evergreen rhododendrons will not thrive.

The ankle-high *R. lapponicum* of the northern mountains both east and west and the arctic tundra, offers bright purple blossoms to the June fog, but cannot endure cultivation in our more temperate climate unless handled by an expert. *R. impeditum* and other relatives from western China are much more adaptable for the rock garden, and many of them superior.

American azaleas, too, have given hardiness to the garden hybrids derived from them, and beauty also, for the best of them compare well with the finest species from other lands. Hardiest in the north is *Rhododendron canadense* (*Rhodora canadensis*) of the boggy highlands, with bright, rose-purple flowers in May. There is also a desirable white form. The ascribed height of three feet is quickly reached and surpassed in cultivation. In fact, I have seen wild clumps chest-high on a New Jersey mountain. *R. mucronulatum* from Korea, though taller, is a better, more adaptable plant of similar color.

R. albiflorum from the Rockies, which is not exactly an azalea, I never succeeded in growing. Its small, whitish flowers are probably not attractive, and it does not seem to be an appropriate subject for cultivation.

In flower *R. Vaseyi* is a charming shade of pink. Out of flower it forms a rather loose, tree-like, tall shrub only fairly hardy, coming as it does from moderate elevations in the Carolina mountains, and not particularly distinguished. Hence, though often and highly recommended, it is not much planted. Perhaps its locality is inconvenient for the more murderous collectors. Nor apparently has it

been extensively used in hybridizing, the flowers being a little small.

Common throughout the east and very hardy in its northern strains, *R. nudiflorum* displays in May various shades of pink, rose and purplish. A twiggy bush eventually sometimes 10 feet high or more, it may be seen in open woodlands wherever the soil is sufficiently acid. Its vigorous constitution caused it to be used early and late in the production of azalea hybrids. Because it varies, botanists have split from it some more or less imaginary species. *R. canescens* differs a little perhaps in the character of its fuzz and has delightfully fragrant flowers. From it is divided again a northern form called *R. roseum*. Anyone examining the wild plants, however, will find little ground for the distinctions. A more southern, white form is called *R. alabamense*.

Later in the season, during June and July, appears the sticky, spicily fragrant, white bloom of *R. viscosum* in and about the bogs, this often narrowly upright shrub reaching eight or ten feet. Southward, where it grows twice as tall, it becomes *R. arborescens*, and in the extreme south *R. serrulatum*, while farther west, in the lower Mississippi Valley, *R. oblongifolium* scarcely differs, though not more than head-high. Again on the east coast, *R. atlanticum* forms low, dense thickets only a couple of feet high, spreading by underground shoots, and flowering a little earlier, about June 1. All these are undoubtedly local forms of the single species *R. viscosum*, which long ago became famous as a parent of those Ghent hybrids which bloom late.

Even more far-reaching is the influence of *R. calendulaceum*, which lends its many shades of orange, yellow and scarlet to the mid-season display. Though lacking fragrance, it is or *was* hardy. Within the memory of old residents, it could be found in northern New Jersey and southern New York, where the brilliance of its flowers and the enthusiastic recommendation of conservationists led to its swift destruction. Even in Pennsylvania it is scarcely found at the present day. Plants brought northward often fail to survive the severe winters of what was once *R. calendulaceum*'s natural range.

This species, too, has been split into subspecies and varieties. *R. speciosum* of the southern mountains is a rather low, red form, less hardy, while *R. austrinum*, extending even farther south into Florida, is clear orange yellow. Along the Pacific coast *R. occidentale* partakes of the same nature, but the flowers are white or pinkish with a yellow blotch, and often fragrant. Its lack of hardiness has not prevented extensive use in breeding the more modern Ghent hybrids.

Finally *R. prunifolium*, a rare azalea from near the Gulf of Mexico in Alabama and Georgia, is said to be scarlet or even crimson, perhaps the most deeply colored of our azaleas. I have not seen it, but judging by the reputation of the man who named it, it is probably only a variant of *R. calendulaceum*.

One tiny species remains to complete the genus rhododendron in our hemisphere. *R. glandulosum* has been found along the coast of Alaska, a sort of reflection of *R. camtschaticum* across the ocean. This is a little, matted shrublet, purple flowered, which refuses to grow in our climate. It is sometimes ruled out of the genus, as is *Azalea procumbens*, now *Loiseleuria procumbens*.

The few native rhododendrons and azaleas will soon be eclipsed by the flood of species from Asia, and high time, for collectors have already destroyed them in large areas of our scarred mountainsides, and spurred on by the urging of our conservationists, bid fair to complete the destruction unless the public hastens to prefer the better species from abroad. Yet it must be kept in mind that for general cultivation, few species, no matter how beautiful, are satisfactory in themselves. Before the Asiatics can be enjoyed by any great number of gardeners in America, they must receive an infusion of American blood and undergo long subsequent breeding to combine the American hardiness with the oriental beauty.

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Bright foliage color is a real asset to an ornamental shrub, particularly in the Puget Sound country. Accordingly, gardeners now have a high regard for *Photinia villosa laevis*, the foliage of which turns to beautiful shades of orange and red in late fall.

Growing Rhododendrons and Azaleas in Eastern Washington

THE following comments on the culture of these two groups of popular ornamentals represents the opinion of several growers who have had success with them under the rather difficult climatic, soil, and water conditions which are found in the Spokane area. Our thanks go to Mr. Aubrey L. White, Mrs. Trumbull, Mrs. Springer, Mr. R. L. Rutter, Mr. Frank Carp, Mr. Herbert E. Smith, and Mr. Schulike for their contributions.

In recent years there has been an increasing interest in the growing of azaleas and rhododendrons in that section. It is to be hoped that our readers in eastern Washington will be able to profit by the information that was gathered by Mr. White.

Dear Editor:

I am enclosing three letters at your request from people in our section who have been growing rhododendrons; the first one from Mrs. W. W. Trumbull, who was a first-prize winner in one of our national garden shows; one from Mr. R. L. Rutter's gardener; and one from a lady in Central Washington.

I am also writing my own experience, not for publication but to show that if one uses proper care in preparing the soil, selecting the proper exposure, and hardy sorts suitable for our climate, and gives them the care they require, we can grow in our districts the "state flower" successfully.

Some thirty-five years ago Mr. Fred Dawson of Olmsted Brothers landscaped my town house and secured and planted fifteen rhododendrons and azaleas. They were shipped from the east and, I think, imported with large balls of earth. The soil was rather gravelly and they were planted under very tall pine trees. They grew well and bloomed for three or four years and then gradually failed. We took no different care of them than of any of the other plantings and did not mulch or enrich the soil. Since our city water is high in lime they just naturally quit blooming and finally died.

At the same time I planted fifteen at my Hayden Lake summer cottage under tall pines, where the water taken from the lake was free from lime, and where the pine needles were allowed to remain as mulch. They thrived and bloomed yearly and grew to great bushes. Now the man who bought the place tells me they have bloomed each year, great shrubs fifteen feet tall, with many blooms on them. The pine land soil, the freedom from lime in the water, with well-rotted cow manure for fertilizer, and the filtered light under the trees seemed to be just right.

I next planted rhododendrons and azaleas along my entrance drive at my country home on the Little Spokane, where they were shaded by deciduous trees, with water for irrigation from a spring and watered from overhead. When I planted them I used peat moss and leaf mold and a fertilizing mixture at the rate of ten pounds of cotton seed meal, four pounds of super-phosphate, two pounds of sulphate of potash and one pound of aluminum sulphate, and at once mulched them with apple tree leaves, pine needles and peat moss. I have added a small dose of aluminum sulphate each spring. Here they grew and bloomed very nicely for two years. Then the deer cleaned up and ate the tops of all but one, an English plant given me by Mr. Ihrig.

My daughter, who now lives on the place, tells me that most of them have now recovered and are budding but others are still struggling.

At my present town house I have ten rhododendrons from ten inches to six feet tall. Four have bloomed this season and are planted, I think, in too dense shade under a large pine tree. The same mixture of soil and fertilizer was used as at the farm. They are growing too tall and leggy.

I have ten azaleas planted in rather exposed places, shaded and protected a portion of the day, from fifteen inches to five feet tall. All bloomed this year, some very profusely. I gave them the same treatment that the rhododendrons got.

I have considerable space and shall attempt further experiments with both rhododendrons and azaleas.

AUBREY L. WHITE.

At the request of Mr. Rutter I shall tell you how we have handled our rhododendrons. They were planted five years ago in a location between large fir and pine trees. We enriched the soil with good, rotted leaf compost and they did very well. The first winter, however, the deer damaged them severely and some still show the effects. But as they come back they grow and bloom well enough.

Every fall the soil around them is covered with pine needles and dead leaves to a depth of six or eight inches and after blooming a heavy feed of Milorganite is applied. The soil is never cultivated, but the plants receive plenty of water from overhead.

WERNER SCHULIKE.

I have one plant (rhododendron) of which I am very proud. It was set out May 31, 1943. It lived and grew well and in 1944 had three large trusses of blooms. In 1945 there were twelve large clusters of flowers.

They (rhododendrons) seem to be very hard to grow in this locality. I know of several people who have tried and failed.

I have been giving this one plenty of water. It is growing luxuriantly and the buds are beginning to form. This is the only rhododendron plant I have ever seen growing and I certainly would hate to do anything to it to make it die now that I have it started.

MRS. A. G. SPRINGER.

When we tried our experiment in growing rhododendrons in Spokane we selected a spot on the north side of a huge rock and one which was partly shaded by pine trees. Then we worked the soil to a depth of eighteen inches to two feet by first digging a hole and placing a thick layer of pine needles in the bottom, followed by a generous amount of leaf mold or compost and rotted wood mixed with the soil. Aluminum sulphate added at planting time and a light application each succeeding year helps to maintain proper acidity.

A heavy mulch of oak leaves, pine needles,

leaf mold or hemlock needles retains moisture as the roots grow near the surface of the ground and should not be disturbed by cultivation.

Our rhododendrons have become well established and our azaleas started from small potted specimens over ten years ago, have grown to sizable shrubs which bloom profusely each year.

MRS. W. W. TRUMBULL.

The rhododendrons on the L. P. Larsen estate were first planted in the spring of 1929. The orders to the Andorra Nurseries, Philadelphia, Pennsylvania, were for plants 18 to 24 inches high, some of which have attained now a height of nine feet or over.

First, they have the ideal natural location, as they are planted on a slope with a background of evergreen trees which extend still further up and along the entire south side of the estate. This gives the partial shade, protection and drainage they require for successful growth. No doubt, Mr. Larsen visualized his favorite and our state flower when he first saw the location. Now they are really something to admire when in full bloom.

Every fall they are mulched with a deep layer of leaves (maple and apple), pine needles, etc. In the spring, as soon as the sap begins to flow, the fertilizer is applied (barnyard preferred), and they are then given a thorough soaking by overhead sprinklers and are kept well watered until the bud opens. Any watering that is done while in bloom is done by hand. After the blooming period is over the flower heads are removed.

During the summer they are given enough water to keep them growing, but not too much, as the new growth becomes too coarse.

If barnyard fertilizer is not procurable, then Vigoro or Milorganite can be applied.

The leaves are never removed or the ground cultivated around the rhododendrons as the cultivating might injure the roots, and the mulch keeps the roots cool.

Before including a list of the rhododendron varieties grown on the Larsen estate, I would like to say: "Mr. A. L. White has taken a keen interest in their progress throughout the

years, and has visited each year while they are in bloom. We have found him very helpful and encouraging as he has given many valuable suggestions and therefore deserves much credit for the success of our rhododendron display."

The list of varieties of rhododendrons grown on the L. P. Larsen estate is as follows:

Album grandiflorum	Light blush changing to white
Atrosanguineo	Deep blood red
Catawbiense	Light pink
Charles Bagley	Cherry red
President Lincoln	Cherry red
Ignatius Sargent	Rose scarlet beautifully marked
Mrs. C. S. Sargent	Bright pink, yellow eye
Parsons gloriosum	Purplish rose
Roseum Elegans	Good rose lavender
W. C. Slocum	Yellow with pink eye
Kettledrum	Rich crimson with purple
Goldsworth Yellow	Lemon yellow
Unique	Yellow
Giganteum	Red
Maximum	Cream
Carolinianum	Dwarf pink
Gomer Waterer	Apple blossom pink, yellow eye

FRANK CARP.

"There are more than eighty rhododendrons on Mr. Larsen's estate. We counted 3,574 clusters of bloom on the twenty-one plants along the path. There were 403 on one large plant. His soil was and is naturally acid, being under an evergreen forest. The water comes from springs behind."—A. L. W.

In reference to your inquiry about the rhododendrons that you planted some years ago at Hayden Lake, I wish to say that these plants are in an extremely healthy condition, averaging a little more than eight feet in height, with a few of them a foot or more above the rest.

They have had very little attention in all these years, bloom profusely for about five to seven weeks, according to weather conditions. Each spring, some years, they are slightly larger than other years, but there are plenty of blossoms.

HERBERT E. SMITH.

"They were planted under a group of pine trees open to the east but shaded from the north, west and south. They were about two feet tall when planted, secured from Andorra Nurseries through Fred Dawson about twenty years ago."—A. L. W.

Azalea Way

PAUL D. BROWN*

COURSING north and south, for a distance of three-fourths of a mile through the very heart of the Arboretum, is Azalea Way. The northern end joins the Upper Road opposite the service yard and the southern terminus is just south of the intersection of Interlaken and Lake Washington Boulevards. The planting plan requires that three general types of plants be used over the entire length of the seven-acre strip — flowering cherries, dogwoods, and azaleas.

The detail plan which is being used as the guide to this planting was prepared by Olmsted Bros., landscape architects, Brookline, Mass. It calls for 150 *Cornus florida*, all of which have been in place for several years, and approximately 700 trees of eighteen different varieties of flowering cherries, which have also been growing nicely since 1940 and 1941. These latter vary from the strictly columnar Amanogawa (*Prunus lannesiana erecta*) through vase-shaped Kwanzan and spreading Mount Fuji, to the extremely weeping types of *Prunus subhirtella pendula*.

The explanation for the rapid growth of the cherries lies undoubtedly in the fact that great care was exercised in preparing the soil properly for each individual tree at the time it was planted. At that time, too, there were large areas prepared for the azaleas, and several extensive plantings of *Rhododendron x altaclarensis*, *R. occidentale*, *R. luteum*, *R. Schlippbachii*, and *R. Kaempferi* were made, together with one particularly fine group of lovely *R. Kaempferi* hybrids that had been bred by Mr. Dexter on Long Island. These groups make up the principal display of color during the flowering season and from them one can get a glimpse at the future picture of Azalea Way.

These original plantings have been expanded tremendously. The 1943-44 planting season was a most favorable one. The young

*For the information of members of the Arboretum Foundation, Mr. Paul D. Brown has consented to present a resume of the work which has been done along Azalea Way with a view to keeping you up-to-date on its development.

azaleas which had been propagated by members of the Seattle Garden Club during 1940, 1941 and 1942 had developed sufficient size to warrant out-planting. This situation, coupled with the fact that more labor was available, led to the planting of 2,489 additional plants during the 1943-44 season.

During the next year, 1,110 more azaleas from the same propagations were planted.

The Olmsted plan for Azalea Way calls for an eventual total of 12,000 azaleas, including 83 species and varieties. Forty-six of these types are already on hand; some have been propagated in quantity; others are in the process of building up the stock.

In addition to the primary list of 83 species and varieties, there were 65 others which were recommended by Olmsted Bros. as being worthy of use. Twelve of these are also being propagated and used.

During the present planting season, which began in mid-October, a special effort was made to develop those portions of Azalea Way which can be seen easily from the boulevard. Approximately 500 feet of beds have been prepared, extending the planting from the north end to a point well beyond Woodland Garden. In these beds 846 azaleas had already been planted by November 10, and all had been mulched with leaves.

Taking into account a moderate amount of mortality it is estimated that there are now something over 6,000 azaleas of flowering size throughout the entire length of Azalea Way.

If the spring of 1945 can be taken as a criterion, the members of the Foundation can look forward to many pleasurable hours along Azalea Way—hours which will become increasingly pleasurable as the cherries, dogwoods and azaleas grow to maturity with the advancing years. And not only will the springtime be pleasurable with its lovely blooms, but so, too, will be the fall, for many of the species and varieties take on bright foliage colors during September, October and early November. Most of the deciduous azaleas are exceptionally attractive late in the year. This is particularly true of *Rhododendron Vaseyi*, *R. calendulaceum*, *R. luteum*, *R. x altaclarens*, *R. molle* and *R. japonicum*. The dog-

woods and flowering cherries, too, are most attractive at this season when their foliage develops the characteristic mingled tones of red and green and yellow.

During the coming months a definite effort will be made to open up views of Azalea Way to the thousands of people who drive through the Arboretum along Lake Washington Boulevard. This has already been accomplished over about one-half the length of the area; the remainder will be finished well in advance of the flowering season next year. The opening up of these vistas coupled with the extensive planting of azaleas along that portion of the Azalea Way which is closest to the Boulevard, will add greatly to the interest and beauty of the section next spring and fall.

At this writing there is another project underway which will add much of interest and color to Azalea Way. Just opposite the pool at the mouth of Rhododendron Glen there is now being planted a landscaped group of rhododendrons, azaleas, flowering cherries and pink dogwoods in honor of Mrs. Alexander McEwan, who has been so influential and energetic in advancing the cause of the Arboretum in particular, and of conservation in general. The group will center around a semi-circular bench which will be so placed as to give a majestic view upward to the east into the slopes of the glen where grow some of the finest of our rhododendrons.

Quite appropriately, many of the species in the group are types for which Mrs. McEwan has always expressed great fondness.

It was decided about a year ago to augment the Azalea Way plantings with groups of hybrid rhododendrons to add greater interest, not only during the flowering season, but also during the winter months when so many of the azaleas are leafless. The first planting was made last spring and includes such fine hybrids as Pink Pearl, Rosamund Millais, Mrs. J. C. Williams, Corona, Mrs. G. W. Leak, Britannia, Pilgrim, Lady Clementine Mitford, Mme. F. G. Chauvin and Mrs. J. H. VanNess. To these have been added, from our own stock, such species as are available in quantity.

Preliminary Report on the Fertilization of Rhododendrons

IRIS WEBER*

IN LATE 1944 an experiment was begun on the fertilization of *Rhododendron ponticum*. This species was selected for the reason that it is generally used as an understock in the grafting of the named hybrids and varieties. It is probably safe to assume that fertilizer to which *R. ponticum* responds satisfactorily will also be beneficial to the scion varieties which are grafted upon it. As the experiment continues it may be demonstrated that such is not the case, but it certainly seems logical that the beginning be made in this way.

The fertilization of soils for rhododendrons is a subject which has been widely discussed. There are several key formulae for mixtures which are frequently recommended in literature. In addition to these mixtures, this present experiment has been designed to show what effects various chemical compounds will have upon ultimate growth. Some of the same compounds appear in the named mixtures but it was deemed desirable to observe the effects of the compound itself, apart from the mixture in which it usually appears.

In addition, one frequently encounters statements regarding the value of various other chemicals and compounds which, while they must be regarded more particularly as soil supplements rather than fertilizers they are, nonetheless, often recommended for application for improving soils in which rhododendrons are to be grown.

Furthermore, there is a third group of materials which is usually not recommended for rhododendrons but which has been included in this experiment because some of the substances supply essential elements. They have also been included with the idea of demonstrating the extent to which the statements regarding the deleterious effects are accurate and correct.

*Miss Iris Weber is an enthusiastic young student of gardening who started the experiment on the fertilization of rhododendrons in connection with her Senior thesis at the University of Washington.

Method

The rhododendron seedlings used were approximately one year old, and were all of the species *Rhododendron ponticum*. They were potted into three-inch pots in a regular soil mixture, between December 5 and 14, 1944, while the seedlings were in a comparatively dormant state. The first application of fertilizer was not made until the plants had had an opportunity to become established in the pots and, with the lengthening of the days, had begun to grow. Just before the first application was made, the plants were moved about on the bench so that those of the various sizes were evenly distributed among the one hundred rows. There were seven plants in each row across the bench, a total of seven hundred plants, with four replications of each treatment. These plots, along with an equal number of check rows (four) were distributed over the bench and their position on it was determined entirely by chance. This was done by shuffling in a box the named designations of each group, written on wooden labels. The labels were drawn out one by one and consecutive positions on the bench were thereby automatically assigned with each drawing.

On January 30, a month and a half after potting, the first application of fertilizer was made. It consisted, as did each application thereafter, of one-fourth teaspoonful of the mixture or compound per pot, worked into the soil around the plant, and then watered in. It was realized that the plants might require different quantities of the various fertilizers and soil supplements, as well as different frequency of applications, but due to the nature of a beginning experiment of this sort, there were no previous recommendations to follow. The most logical alternative was to use the same amount of each substance. It was, however, considered advisable to discontinue applications if the effects on the plant were definitely deleterious at any stage of development (as in the case of boron.)

The second application was made three weeks later, on February 22. The third and

last one was made on April 6, or nine and one-half weeks after the beginning of the treatments.

Procedure

The plants were examined for results every few days, and any changes were recorded. After twelve weeks from the first application, all rows immediately adjacent to the boron plots showed injury of the type characteristic of boron, and the boron plots were removed one week later. The boron did not kill any of the plants in the adjacent plots. Neither did it seem to affect their growth particularly.

The last observations for this beginning phase were made from May 15 to 22, 1944, and consisted of measuring and recording the height of each plant, as well as noting any foliage discolorations, or any other results, positive or negative. Soil samples were taken from an average pot in each row and pH was determined with a galvanometer. After these were recorded, the plants were moved to the lath-house for the summer. There the treatments will be continued.

Formulae of Fertilizers Used in Experiments on *Rhododendron Ponticum*

Ihrig's Formula:

	Amt. Used
1 lb. ammonium sulfate	(45.4 grams)
3½ lbs. superphosphate	(158.9 grams)
2 lbs. sulfate of potash	(90.8 grams)
2 lbs. cottonseed meal	(90.8 grams)
(soy bean meal substituted, because cotton seed meal was not available.)	
1½ lbs. aluminum sulfate	(68.1 grams)

Dexter's Formula:

1 part potassium nitrate	(151½ grams)
2 parts superphosphate	(302½ grams)
<i>Coville's Formula:</i>	
10 lbs. cottonseed meal	(296.25 grams)
(soybean meal substituted, because cotton seed meal was not available)	
4 lbs. superphosphate	(114.4 grams)
2 lbs. sulfate of potash	57.2 grams)

White's Formula:

10 lbs. tankage	(227 grams)
(Nu-Life Fertilizer substituted because tankage was not available.)	
1½ lbs. ammonium sulfate	(34 grams)
2 lbs. magnesium sulfate	(45.4 grams)
1½ lbs. muriate of potash	(34 grams)
5 lbs. bonemeal	(111.5 grams)

Chemical Analysis of Commercial Fertilizers Used in Experiments on *Rhododendron Ponticum*

Lilly's Acid Morcrop (for acid loving plants):

Nitrogen 5 per cent
Phosphoric Acid 6 per cent
Potash 8 per cent

Contains: aluminum sulfate, sulfate of ammonia, and sulfur.

Lilly's Vita-Minerals (Plus Vitamin B₁ and plant hormones)

Includes: magnesium, sodium, boron, zinc, manganese, iron, copper, iodine and sulfur.

Sulfate of Potash

0-0-60

Superphosphate

0-20-0

Muriate of Potash

0-0-60

Nu-Life Lawn and Garden Fertilizer

Nitrogen 6 per cent

Phosphoric Acid 10 per cent

Potash 4 per cent

Vigoro Complete Plant Food

Nitrogen 4 per cent

Available Phosphoric Acid 1.2 per cent

Potash K₂O 4 per cent

Lux Morcrop Fertilizer (Lilly's)

Nitrogen 5 per cent

Phosphoric Acid 6½ per cent

Potash 8 per cent

Also calcium

Buffalo Bone Meal

1-20-0

Results

The following tables express, in a gross sort of way, some of the indicated responses of the seedlings of *Rhododendron ponticum* to treatments with these various fertilizers.

Ratings of Various Fertilizer Treatments on *Rhododendrons* According to the Results of This Experiment

Order	Formula	Av. Hgt. inches	Plants Died	pH
1.	Superphosphate	3.8	0	6.6
2.	Charcoal	3.6	0	6.6
3.	Ihrig's Formula	3.6	1	6.4
4.	Coville's Formula	3.5	1	6.5
5.	Talcum Powder	3.2	0	6.8
	Minorgano	3.2	0	6.4

These are the six treatments which proved superior to the check, or untreated, groups.

6.	Check	3.1	0	6.7
	Buffalo Bone Meal	3.1	0	5.9
	Hydrated Lime	3.1	0	6.4
	Ground Lime Rock	3.1	0	6.9
7.	Lilly's Acid Morcrop	3.1	2	6.7

These are the four treatments which were of the same value as "no treatment" (check).

8.	Sulfate of iron	3.0	1	6.4
9.	Sulfate of Aluminum	2.9	0	5.9
10.	Magnesium Sulfate	2.8	0	7.0
11.	Vigoro	2.7	3	6.0
12.	Lux Morcrop	2.6	2	6.3
13.	Dexter's Formula	2.6	6	6.5
14.	White's Formula	2.5	5	6.4
15.	Nu-Life Fertilizer	2.4	1	6.8
16.	Lilly's Vita-Minerals	2.2	0	7.0
17.	Sulfate of Potash	2.0	1	6.7
18.	Sulfate of Ammonia	1.8	12	6.6
19.	Potassium Nitrate	1.2	26	6.5
20.	Muriate of Potash	1.1	9	5.2
21.	Boron	0.0	28	---

These are the fourteen treatments, which, in this experiment, detrimentally affected normal growth.

Magnolias

LORD ABERCONWAY*

SOME of the finest plants that can be grown in gardens are the magnolias, of what one may call the *Magnolia conspicua* group, that is to say, the large-flowered magnolias which flower before the leaves appear.

The most beautiful of all these is *Magnolia Campbellii*, but it is rather unhappy if the temperature goes below zero Fahrenheit, and this temperature would also kill the undeveloped flower buds. When it flowers, however, with its 10-inch pink blooms on the bare branches, hundreds of them all beautifully cup-shaped, there is probably no plant which surpasses it in beauty.

Magnolia mollicomata is very similar. It is a little more hardy; it flowers a fortnight later, which is an advantage; it is even more free-flowering, it flowers younger in life, say, at twelve years from seed. But its flower petals, which start cup-shaped as in the case of *M. Campbellii*, soon fall apart, and although still lovely, they have then not quite the quality of those of *M. Campbellii*.

Magnolia Sargentiana in its form *robusta* (probably quite a separate species from the plant known as *M. Sargentiana* itself), is perhaps the most striking of all magnolias when in flower. The large, mauve-pink flowers are borne in the greatest of profusion, and although they have not quite the good shape of the flower of *M. Campbellii*, they are, if anything, larger and they are more abundant. This magnolia will flower quite young. It is a good deal more hardy than the first two mentioned, and it is very distinct with its great, hooked, hairy flower buds and truncated leaves.

Magnolia Sargentiana itself differs from *M. Sargentiana* var. *robusta* in that it takes longer to flower, and its flower apparently is

not quite so good. It is a more slender and tender tree with many differences in leaf and habit from its so-called variety.

Magnolia Dawsoniana is perhaps the least good of the five, rather like *Magnolia Sargentiana* var. *robusta*, but with a different leaf and not quite so good a flower.

Except *Magnolia Campbellii*, these are all the new introductions and most interesting.

The best form of *Magnolia conspicua* closely rivals them for garden purposes. Its pure white bloom; its habit of flowering very young; its greater hardiness all commend it. When, however, it is once crossed with *Magnolia liliiflora*, the resulting hybrid, known as *Magnolea Soulangeana*, flowers when the leaves are appearing and this spoils a great deal of the beauty of all the many named forms.

Another group of species which is very attractive (but which I think definitely takes the second place to the group that I have already mentioned), namely, *Magnolia parviflora*, *Magnolia Wilsonii* and *Magnolia sinensis*, are all very similar to one another with possibly *Magnolia sinensis* as the best. They flower over a long period but with the leaves. The form of *M. parviflora* which has deep scarlet stamens is much better than the usual form with somewhat washy mauve stamens.

To leave the species, one might refer to two good crosses. One is *Magnolia Veitchii* which is *M. Campbellii* crossed probably with *M. Soulangeana*, a fast-growing, hardy, somewhat brittle tree of great size, again rather suffering from the fact that the leaves too closely accompany the flowers.

The other hybrid is *Magnolia Watsonii*, a hybrid of *M. parviflora* and *M. hypoleuca* with strongly-scented, large, and beautiful flowers appearing with the leaves.

In referring to these magnolias I use the old established garden names as I much resent the many changes in nomenclature made by certain systematic botanists.

*The Rt. Hon. Lord Aberconway of Bodnant, Tal-y-Cafn, North Wales, is another of England's outstanding horticulturists. He has been particularly active in the propagation and breeding of a wide range of ornamental plants including rhododendrons. Evidence of his position in English horticulture is the fact that he is now President of the Royal Horticultural Society. The present popularity of magnolias as garden subjects makes his comments on them particularly timely.

Journey to Royston

ELSE M. FRYE*

FOR a long time I had wished to go to Royston (Vancouver Island). At long last my wailing and lamentation penetrated to that dim and distant land of mosses and liverworts where my botanist husband spends so much time and the start was made.

Space on the Canadian Pacific ferries being reserved far into the future, we decided to get up well before the "crack of dawn" and get into the early line of cars embarking from Anacortes.

The trip among the Islands is always something of an enchantment, but in the early fall the colors are full of splendor—the tawny, yellowing grass and moss coming down to the sea, the dusky greens of conifers, the flame of the vine-maple and the rusty-red boles of the madrona trees are the motifs of the overall pattern. We arrived in Sidney shortly after one o'clock and continued our way through the foothill country that is Vancouver Island, now high up, looking over fjord and stream, and again low down through small valleys.

Royston Nursery itself is on the curve of Comox Bay. The tide runs out a mile. In the distance is the Coast Range, at this moment weighted with clouds. Into the distant water come the sportive blackfish, and nearer, the curious seal. All sorts of sea-fowl gather close to shore. One would never tire of looking at the shifting scene and with it all there is the fresh tang of the sea and the wind that has come from afar.

The gardens here were begun twenty-six years ago in virgin country and with poor soil. This has been completely made over and indeed is still in the process, as evidenced by the huge pile of sod, decomposing into beautiful fibrous loam. It is not a huge place; scarcely an acre and enclosed on three sides by a solid board wall, now weathered and softened by overhanging native shrubbery. To the sea side is a stone wall which long ago lost any feeling of newness if it ever had any. The garden treasures are in the front of the house—rare

specimen rhododendrons, large and small, among the rocks. Can you imagine a bank covered with *Rhododendron myrtilloides* or a steep slope retained by *R. keleticum*? And so the whole planting is—ample and right. Hardy cyclamen grow carelessly about without pattern. In the far foreground is a little heather moorland garden, a fine collection of all the better varieties.

The nursery itself is at the back of the house and for the most part is under a high half-shade ceiling. Mr. and Mrs. Greig may take the greatest pride in their foliage; it is magnificent. I saw a great many things I had read about but never seen: A collection of species of the *Taliense Series* had wonderful leaves, dark and shining green above with the most beautiful and fascinating indumentum beneath varying in the different species from a pale chamois-skin color to a rich, bright orange-cinnamon. This seed had been collected by Rock.

One plant of *R. calophytum* measured six feet high by seven across; a *R. discolor* ten feet by ten feet. It is difficult to imagine them. One of the things that interested me most was a plant of *R. repens* which is one of George Forrest's original collections made in 1924. It lies flat on the ground and measures five feet by three and a half. And that after a one-foot fringe of rooted branches had been removed from the whole circumference! There were many other precious single specimen plants.

R. Griersonianum x decorum had been full of very large lily-like, clear, pure pink flowers. It must have been a spectacle. I was surprised and delighted to see *Soldanella montana* used as a ground cover among the rhododendrons, the fat, kidney-shaped leaves making a nice low mound of dark green and seedlings spilling in all directions.

There were other interesting features in this garden—a long and narrow scree given over entirely to *Saxifraga*. It must be a glory in spring. And a much larger scree within old cement walls was reserved for all sorts of other treasures. *Ramondia* and *Haberlea* almost as large as plates lined the walls leading to the cellar.

(Continued on Page Nineteen)

*Mrs. Else M. Frye contributes another one of her interesting discussions of a trip to Vancouver Island.

Col. F. R. S. Balfour

W. BALFOUR GOURLAY*

FREDERICK ROBERT STEPHEN BALFOUR came of Scottish parentage. His father, Alexander Balfour of Leven in Fife, while still a young man, formed a business partnership in Liverpool with Stephen Williamson, another young Scot, and thus founded the well-known merchant and shipping firm of Messrs. Balfour, Williamson & Co., the parent firm of Messrs. Balfour, Guthrie & Co.

Fred Balfour, as he was known to his friends, was born at Mount Alyn, Rossett in Denbighshire on March 11, 1873, and spent his early years there. But after his father's death in 1886 his mother returned to her native Scotland, and Fred was sent to Loretto School, near Edinburgh, in 1887, and subsequently studied and took a degree at Oxford University. But meanwhile his mother had purchased the house and estate of Dawyck, Stobo in Peeblesshire (in the South of Scotland), which became the country home of the family.

The estate consists of several thousand acres of heather and grass-clad hills, well wooded on their lower slopes. Previous owners had taken a great interest in arboriculture and had introduced there many trees from foreign countries where similar climatic conditions prevail. Thus horse chestnuts were introduced to Scotland at Dawyck about 1650, and the European larch in 1725. Among the trees brought early to Dawyck were many fine conifers from California and Washington. From 1900 Fred Balfour spent some four years or so in business in N. W. America and there saw some of the great conifers of that country which he had known in cultivation at Dawyck. This experience stimulated, and directed along arboricultural lines, his tendency to make collections wherever he went; and resulted in his attempt to try out at Dawyck, under forest conditions, all coniferous trees

*In view of the interest of Colonel F. R. S. Balfour in the Pacific Northwest and in particular because of the fact that he was influential in interesting Dr. Cecil Tenny to grow the Asiatic rhododendrons which now constitute our chief display in Rhododendron Glen, Mr. W. Balfour Gourlay, nephew of the late Mr. F. R. S. Balfour, generously consented to prepare the above notes on the life and work of his well-known and well-loved uncle.

likely to grow there and prove useful. Such experiments with conifers and deciduous trees from Western N. America, China and elsewhere, have been of great value to scientific forestry.

After his marriage, in 1904, to Gertrude, daughter of the late F. H. Norman, of Much Hadham, Herts, Balfour took up work in London, but visited Dawyck whenever possible and also made several short business visits to Northwest America, usually returning with some arboricultural spoils. Perhaps the most beautiful of his introductions is the rare weeping spruce of the Siskiyou Mountains (*Picea Breweriana*), which grows to perfection at Dawyck.

Balfour was a member of the Home Grown Timber Committee during the first World War, and was also sent as liaison officer to the French Government.

His interest in natural history was, however, not confined to trees and shrubs. Until war conditions prevented such pursuits, he kept valuable collections of ornamental birds—mostly pheasants, ducks and geese—from various countries of the world.

In London he was a director of Cables & Wireless, Ltd., the Guardian Insurance Co., Bank of Montreal, and various other companies, but found time for arboricultural work as well. He was on the executive committee of the Conifer Conference, held in London in 1931, and published various papers on arboricultural subjects, e.g., "The Planting and After Care of Roadside Trees" (*Quar. Journ. of Forestry*, July, 1935). He also wrote about Scottish botanical explorers, notably Archibald Menzies and David Douglas (whose names are associated respectively with the Menzies Spruce and Douglas Fir).

Fred Balfour took a special interest in the welfare of seamen, as his father had done before him in the Liverpool district. He was always genial and nothing pleased him so much as to be doing some kindness to a friend or acquaintance. His life, which was a happy and useful one, ended after a short illness, on February 2, 1945. He leaves a widow, a son and daughter, both married.

The Arboretum and the University of Washington Campus An Historical Note

EDMOND S. MEANY, then a young man only six years out of college, had a vision for a great heritage for his alma mater, the University of Washington. He wanted a beautiful and commodious campus. The small ten-acre campus downtown was being crowded by the fast approaching development of the little city of Seattle. Meany was an idealist and a poet and he saw in Section 16, Township 25 North, Range 4 East (a common school section of 583 acres) the veritable poem of his dreams. How to secure it? He went to some political friends and said: "Send me to the state legislature and give me a chance to secure that new campus." They sent him in 1891 and they returned him in 1893. The campus was purchased by legislative acts of those two sessions—160 acres in 1891 and the remaining acreage in 1893.

Two of young Meany's enthusiastic arguments used in the legislature were: first, that a number of universities in the United States had campuses bordering on one fresh water lake, but that two beautiful lakes were none too many to lave the campus of the university named for the Father of His Country; and, second, he urged that "nature had provided this cherished area (the present campus site) with the ready-made characteristics of the grandest of arboretums." Further, Legislator Meany promised the influential timber men of the day, both in and out of the legislature, that if they would see this bill through, a scientific arboretum would be established which would aid greatly in the research problems of timber culture in the state. He pointed out that eventually this would repay the cost of the campus many fold by its laboratory facilities. The arguments won and the author of the bill, Edmond S. Meany, then alumnus and legislator and later registrar and secretary of the Board of Regents, took personal interest in fulfilling this promise. Arbor Day planting was initiated and supervised by him and this resulted in the addition of several thousand trees on the campus. Many were obtained by exchange and correspondence with

leading arboretums in foreign nations; ash, birch, beech, box elder, catalpa, elm, honey locust, horse chestnut, ironwood, linden, liquidambar, maple, poplar, walnut, larch, etc.

At one time the City of Seattle contributed about 2,000 trees, but during the rush of clearing the way for the A. Y. P. Exposition in 1909 a large number of these were destroyed either outright or by futile attempts to transplant in the wrong season.

The portion of the campus now known as the golf course, bordering the canal, was at one time known as the arboretum area, but the appropriation of that area by the naval training camp during the World War (1917-1918) destroyed a great deal of that planting. The city park commissioners early in the '20s passed a resolution granting the University use of the Washington Park area for purposes of an arboretum, but no lease was then consummated. However, in 1930, the Arboretum and Botanical Garden Society of the State of Washington was incorporated and it was then determined to accomplish something in the way of their cherished hopes. But the depression blocked any progress at that time and the matter lay dormant until 1934 when a lease of the 261 acres was made to the University. It was thus that the acquisition of this tract, formerly known as Washington Park, brought to reality a dream of more than forty years standing. The lease was formally signed on January 4, 1935. By its terms the University assumed the responsibility of developing the area along scientific lines and since then the civic sponsors of the plan, together with the University faculty members, have accomplished a great deal in the development of the property. In 1939 the legislature conveyed to the University additional shore lands of approximately eight acres adjacent to the tract leased by the park board, for aquatic features for the Arboretum. In addition to the contributions of the City of Seattle and \$3,000 given by the Seattle Garden Club for landscape architect services, the Arboretum has received from W. P. A. sources, for some nine projects, a sum in excess of a million and a half dollars.

The Arboretum Bulletin

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Editor JOHN H. HANLEY

ARBORETUM FOUNDATION OFFICE HOURS

9 a.m. to 12 m., Monday through Friday
Phone SEneca 0920

Special Notice

To keep memberships in the Arboretum Foundation in good standing, dues should be paid during the month payable. Memberships more than three months in arrears will be dropped and the BULLETIN will be discontinued.

Arboretum Membership Blank

<input type="checkbox"/> Active	\$ 5.00
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I hereby apply for membership in the Arboretum Foundation and remittance for same is enclosed to cover dues for the next succeeding 12 months.

Name

Address

All memberships are non-assessable.

*Garden Clubs—Affiliated membership \$10.00 minimum.
Special rate privileges to members of Affiliated Garden Clubs and Arboretum Units.

The schedule listed above has the following exceptions:

a. That members of Garden Clubs, affiliated with the Arboretum and having membership of not less than \$10.00, shall be entitled to a \$2.00 or Associate membership.

b. That members of Arboretum Units shall be entitled to a \$2.00 or Associate minimum membership.

c. This schedule applies only to new memberships.

The Rhododendron Issue

SOMEWHAT more than one year ago the Arboretum Foundation's Bulletin Committee decided to dedicate the Winter issue to rhododendrons, azaleas, and either closely allied or companion plants.

Perhaps the most notable single factor which favors rhododendron culture here in the Northwest is that of climate—a climate which is mild when measured by the lack of extreme cold in winter and extreme heat in summer—a climate which, nevertheless, is cool enough, raw enough, and moist enough during most of the year to supply an ideal environment for the many diverse species, varieties, and hybrids of the genus *Rhododendron* which have either been brought from their native habitats in the north temperate zones of the world or which have been developed by horticulturists under temperate zone conditions.

Considering the whole of the United States, one must recognize that rhododendrons can be grown in many sections. Elsewhere in this Bulletin will be found information on their performance in eastern Washington, along the Atlantic seaboard, and into the eastern edge of the Middle West. We know of gardeners who have had moderate success with them in the Lake States, too, and there are, of course, some fine plantings of them in California.

But the degree of success which is obtained by the gardeners who are attempting to grow rhododendrons in most of these sections is measured by (1) their selection of the hardiest forms and by (2) the lengths to which they must go in creating the proper environmental conditions or, stated in another way, the lengths to which they must go in actually changing the natural climatic conditions over a localized tract to meet the requirements of the plant.

The rhododendron fancier in the Pacific Northwest has an extended list of types from which he can choose with the full knowledge that it will be unnecessary to go to any great lengths in altering the existing, natural conditions so that the plants may thrive.

In the matter of soils, too, he usually finds himself fortunately placed. The Puget Sound



The following group of rhododendron pictures, taken in the beautiful garden of Mr. and Mrs. Donald G. Graham, is displayed through their kindness and courtesy.

Above—A mixed grouping of Azalea Hinomayo, Rhododendron Mrs. E. C. Stirling, Kalmia latifolia and Clematis montana.

Below—Azalea mollis (Primrose Yellow), Rhododendron Pink Pearl, Magnolia grandiflora, and Clematis montana.





*A typical truss of
Azaleodendron var.
Glory of Littleworth*



*Two fine varieties—
Betty Wormald and
Mrs. G. W. Leak*



*The flowering habit
of Betty Wormald*

*Azalea var. Mrs.
Oliver Slocock*



*The beautiful Loderi
var. King George*



*Azalea Daviesii and
tree peony in front of Rhododendron
Pink Pearl and
Wisteria*

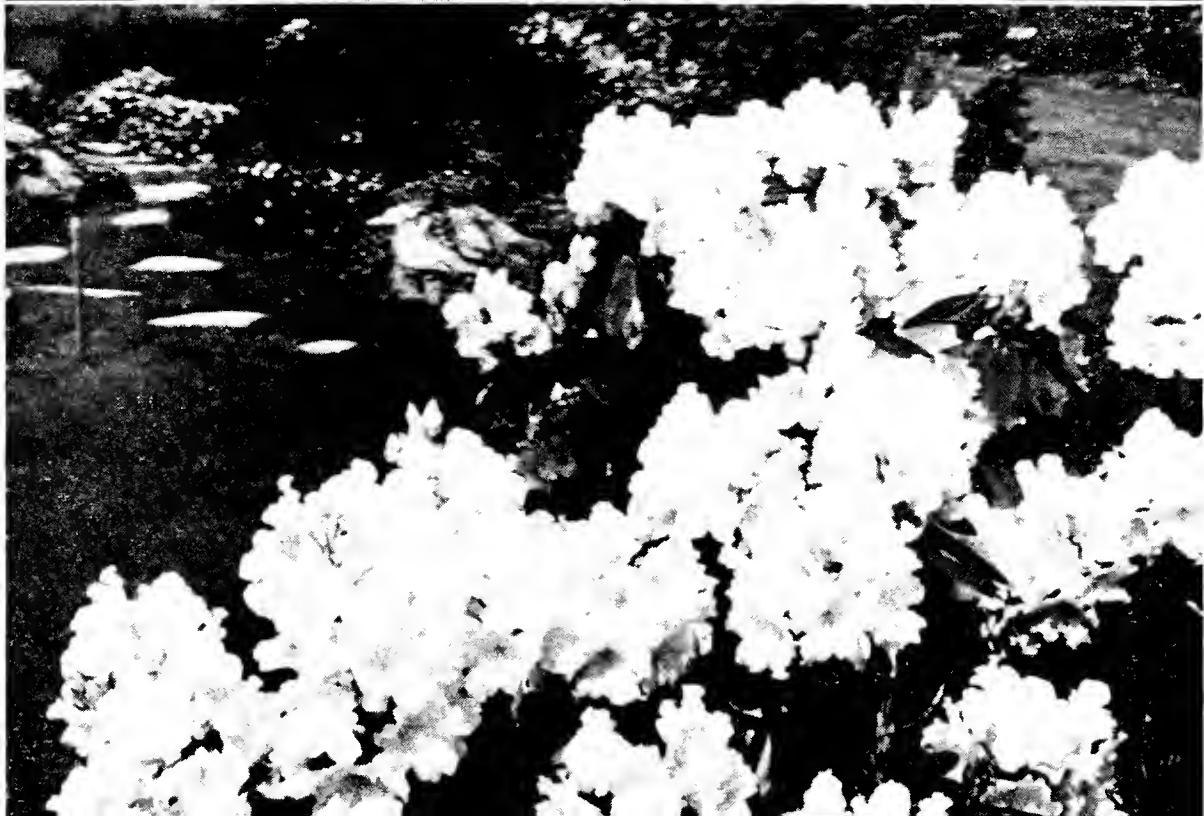




*Lady Stuart of
Wortley*



*Loderi King
George*



*The flowering
habit of
Loder's White*

climate affords ample rainfall to leach away the alkali salts which most rhododendrons seem to dislike. The degree of soil acidity which is thereby obtained is quite suitable to the average rhododendron.

The recognition of rhododendrons as ideal ornamental types for gardens in the Northwest is not something brand new. Mr. F. R. S. Balfour, the late, prominent British horticulturist, was convinced of the desirability of introducing and growing them here at the time of his extended visit shortly after the turn of the century. Largely through his encouragement a beginning was made. From that beginning, the interest in rhododendron culture has been building up until, at the present moment, it has reached a near-flood stage.

Looking into the future, it is not difficult to imagine what the next twenty-five years will bring. Rhododendrons are being planted everywhere. They grace the lowliest and smallest home plantings, the pretentious grounds of the estates, the parks, the parkways, and the planting of them along the highways has already begun. The great adaptability of the many species, within the favorable limits set by the climate, and their extensive variability in color, form, size and texture renders them usable in innumerable ways, a fact of which every advantage is being taken. As this widespread use of rhododendrons increases and expands, and after sufficient time has elapsed to bring the plants to full maturity, the Puget Sound country will most certainly become known as the land of the rhododendrons. The prospects for the development of outstanding beauty from these lovely plants in the next quarter-century are tremendous and most certainly pleasant to contemplate and to anticipate.

The extension of the use of rhododendrons over greater areas west of the Cascades as well as into the central and eastern portions of the northwesternmost states poses several interesting problems, to the solution of which the work of the Arboretum will be directed. Foremost among them is the problem of hardiness. To use western Washington as an example, it is well known by rhododendron growers that

the local environmental conditions as among any given group of gardens will limit the types which can be grown. Gardens situated near the water are very apt to provide the milder conditions which some species require while an inland, low-lying tract may be both too wet and too cold for the same plant. Progressing then eastward into the foothills of the Cascades and thence over the top into central and eastern Washington, the temperature conditions become decreasingly amenable for the Asiatic species, their varieties and hybrids. Gardeners in these sections place greater and greater reliance upon the *R. catawbiense* hybrids, a group which in general is inferior to the newer hybrid races and strains, except that they are hardier.

In order to provide better rhododendrons for use in such areas, a program of breeding should be undertaken using the hardiest forms of *R. catawbiense* and *R. maximum* as one set of parents, and the beautiful, large-flowered, Asiatic species, varieties and hybrids as the other.

A start has been made in this direction.

Through Dr. Donald Wyman, horticulturist at the Arnold Arboretum, we were able to procure seeds of *Rhododendron maximum* collected from a group of native plants there in New England. These seeds have been planted and the plants are now developing in seed flats. In addition, Dr. Wyman has procured and is now raising young *R. maximum* seedlings from a still more northerly group, and when these become of sufficient size to withstand shipment, he has promised that we will be provided with some of them.

Using these northern strains as the hardy stock, it is conceivable that we can expect more resistant strains that will be adaptable to conditions such as those which are found farther up in the foothills of the Cascades as well as in central and eastern Washington.

The azalea series of rhododendrons also holds forth certain possibilities in the same direction. It has been reported to us on good authority that the species *R. Schlippenbachii* is able to withstand the severe climatic conditions that prevail at Toronto, Canada. Not only is the temperature severe at this location,

but it is suspected that the soil is somewhat alkaline and it is entirely possible that this species does therefore have certain qualities of both hardiness and adaptability which would make it a most desirable parent in the breeding of strains for central and eastern Washington and other similar regions.

The Belgians and the Dutch have both gained quite a reputation for the development of certain types of azaleas. For example, they have created the so-called Ghent race, using a great number of species from various parts of the world. It is reported that they used *R. calendulaceum* from southeastern United States as one parent. It is known that they have also used the species *R. viscosum* from eastern United States as another. *R. viscosum* has the desirable quality of being a late-blooming type and that quality has been transmitted to many of the seedlings. They have also used *R. occidentale* from northwestern United States and it is now possible to procure lovely late-blooming forms of the occidentale hybrids.

While the Ghent hybrids are certainly most desirable, there are some features which make them rather difficult to handle. This is found particularly in the matter of propagation. There seems to be no simple, easy, rapid method of multiplying them in great quantities. Hence, it has seemed to some of us that a start should be made in the development of a race of azaleas designed to supplant the Ghent hybrids and predicated upon the thesis that the race must be easy to propagate by cuttings. Among our azalea species and varieties at the Arboretum there are now several types which appear to be ideal parents for such a line and these are now being used for plant breeding with the expectation that such a race will ultimately be forthcoming.

The expansion of rhododendron culture through an increasing use of the many available ornamental species seems assured here in the Northwest. The many desirable qualities of the rhododendron species make this almost a foregone conclusion. However, before fullest advantage can be taken of any given species, it will be necessary that someone devote real time and thought and effort to the perfecting of it. It has been mentioned

elsewhere in this issue that the degree of variation one finds within a rhododendron species may be very great. It may be so great, in fact, that botanists may be prone to divide a given species into several species or sub-species. From the standpoint of the gardener this simply means that those largest-flowered, best colored, best formed individuals from each promising species must be selected and propagated vegetatively before we can get the utmost in value from them. It must be admitted that at the present moment a gardener who purchases rhododendron species plants for use in any one of the many ways to which the species are adapted runs the risk of purchasing more undesirable ones than desirable ones.

The existence of very desirable forms among the plants of an otherwise undesirable species has been amply proven by our experience here at the Arboretum. Even some of our most showy groups such as *R. Augustinii* and *R. rubiginosum* would be vastly improved if we could eliminate the poorly colored and poorly shaped individual plants and replace them with those which are much more beautiful from within the same species. We have, for example, one early-blooming form of *R. Augustinii* and one late-flowering individual of the same species which are beautifully colored in addition to possessing the qualities of varying time of blooming. We also have a few plants of *R. rubiginosum* which are so much better than the mine run that there is little comparison in their garden values.

Going down through some of the other species that exhibit the same propensities we find *R. villosum*. One particular plant of the species exhibits an intense purple color which is very unusual and of which we are taking advantage through vegetative propagation from this single specimen. *R. carolinianum*, which is also mentioned elsewhere in this issue, is represented in our collection by a rather nice grouping near the pool at the mouth of Rhododendron Glen, yet when the plants are in bloom at the height of the season, a few are distinctly good whereas the bulk are mediocre to poor. We plan to propagate vegetatively from these better individuals and ultimately to replace the mediocre and poor forms

with them. The same is true with the Korean azalea, *R. mucronulatum*. This is, of course, one of the earliest flowering azaleas that we have. As a matter of fact, it blooms too early for many locations. Since it seems to be perfectly hardy, we feel that not only should we propagate from those individuals which show a distinctly good strong pink color, but that we should place the plants in the cooler parts of the Arboretum so that bud development during the winter and early spring would be delayed. By so doing it is possible to have the flowers appear late enough to avoid the late spring frosts which, when they are very severe, otherwise kill the flowers and make the whole plant unsightly. When it is widely realized by commercial growers and by gardeners that they can take full advantage of such species improvements as are mentioned here, there is little doubt that the use of the species rhododendrons will grow by leaps and bounds. There will be no chance, of course, of the species ever outdoing the hybrids insofar as popularity for garden usage is concerned but because they, the species, do exhibit qualities which the ordinary hybrids do not possess: namely, earliness and lateness of blooming, great variation in ultimate height from several inches to many feet, and adaptability to a wider range of soil and temperature conditions—when these things are realized, there is no doubt but what there will be an increased use.

In many parks and roadside areas, species are much more desirable. The hybrids too often labor under the disadvantage of appearing too civilized. They definitely lack the wildness and the naturalistic appearance of the species and in many areas such an appearance is just what is wanted and needed.

Rock gardens and rocky walls and slopes such as may be found everywhere in the Puget Sound region do not provide the proper setting for the average hybrid rhododendron, whereas it is possible to find many types of species which are perfectly at home both from the standpoint of their physical adaptability as well as from their appearance in such locations.

JOHN H. HANLEY.

Small Garden

(Continued from Page Two)

like Joseph Rock to enthusiasts in California and elsewhere.

I am sorry to be so insistent on this matter of form, but in the course of years we have found that rhododendrons vary as much as, or more than, most plants. When the popularity of rhododendron species began to increase about 1919 we grew everything we could. During the next few years much of my time will be taken up with scrapping those that have proved themselves to be below standard. Many should have been out years ago. Thus I go on stressing that the fewer the plants you intend to grow the more choosy must you be. There is an old proverb in our part of the world: "You cannot make a silk purse out of a sow's ear."

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Royston

(Continued from Page Thirteen)

Royston is sufficiently far north to make gardening a very exacting labor. For instance, cold-frames are deep in the ground and at that they have to have two floors, the top floor for summer, the bottom floor for winter. A time-consuming chore and back-breaking to change over at either season! I never could understand why it was such a bother for Mrs. Greig to look into the cold frames in winter; now I know it is an almost impossible task. The Greigs do their propagating the slow way, by cuttings—each plant stands on its own roots. They use much less water than I do. I concluded that was a matter of soil: their old peat soil retains moisture; roots can get strong hold on it while my sandy soil cannot hold the water and roots cannot really cling to sand particles.

When we came away the car was so full of plants that the botanist husband could not see out of the back window; our suitcase was fastened to the outside and the very last box was firmly planted on my lap! I shall not soon forget my pleasant days at Royston.

 , , ,

Plan your 1946 garden now and include plenty of colorful flowers in it.

Hybrid Rhododendrons

Courtesy of THE SEATTLE GARDEN CLUB*

A—Very Hardy		B—Hardy		D—Requires Shelter
Rating	Name	Color	Blooming Time	Height
<i>White</i>				
***	Beauty of Littleworth (B)	White	May	Tall
***	Dr. Stocker (C)	White	April	Tall
****	Loderi, var. King George (C)	White, Pink Buds	Early May	Tall
***	Loder's White (C)	White, Pink Buds	Early May	Tall
***	Queen of the May (B)	White	May	Medium
***	Sir Charles Lemon (C)	White	April	Tall
<i>Blush</i>				
***	Faggetter's Favorite (B)	Blush Pink	April-May	Med. Tall
**	Mrs. E. C. Stirling (C)	Blush Pink	May-June	Tall
***	Mother of Pearl (B)	Blush Pink	May	Medium
**	Sweet Simplicity (A)	White-edged Pink	May	Medium
<i>Pink</i>				
**	Amy (B)	Bright Rose Pink	May	Medium
***	Betty Wormald (C)	Pale Pink, Purple Blotch	May	Med. Tall
***	Cornish Cross (C)	Dull Rose Pink	April-May	Med. Tall
**	Corona (B)	Coral Pink	May	Med. Tall
**	Countess of Derby (B)	Rose Pink	May	Med. Tall
***	Dr. O. Blok (B)	Pink-edged, Paler Center	May	Med. Tall
***	Lady Stuart of Wortley (C)	Pink	May	Med. Tall
***	Madame Fr. J. Chauvin (C)	Rosy Pink, Deep Blotch	May	Med. Tall
***	Mrs. Furnival (B)	Light Pink, Sienna Blotch	May	Med. Tall
****	Mrs. G. W. Leak (C)	Pink, Brown-Purple Blotch	May	Medium
***	Mrs. Philip Martineau (B)	Rose Pink, Yellow Blotch	May	Med. Tall
**	Pink Pearl (B)	Rose Pink fading to Blush	Late May	Tall
*	Rosa Mundi (A)	Pale Pink	February	Low
<i>Rose, Salmon and Cerise</i>				
***	Azor (B)	Soft Salmon	May to June	Medium
*	Cynthia (B)	Rosy Salmon	May	Tall
***	Rosamund Millais (C)	Cerise, Umber Blotch	May	Medium
<i>Reds</i>				
**	Black Beauty (B)	Dark Velvet Crimson	May	Medium
***	Britannia (B)	Bright Crimson	May-June	Medium
**	C. B. Van Nes (C)	Dark Scarlet	April-May	Medium
***	Cornubia (D)	Blood Red	February	Medium
****	Earl of Athlone (C)	Bright Blood Red	April-May	Medium
***	Ivery's Scarlet (D)	Blood Red	April-May	Medium
***	J. G. Millais (C)	Deep Blood Red	May	Medium
****	Mars (B)	Deep True Red	May-June	Medium
***	Princess Elizabeth (B)	Deep Crimson	May	Medium
***	Queen Wilhelmina (C)	Scarlet fading to Rosy Pink	April	Medium
**	Unknown Warrior (C)	Bright Red	April	Medium
<i>Yellow and Apricot</i>				
***	Butterfly (B)	Pale Lemon, Chocolate Blotch	May	Medium
**	Cunningham's Sulphur (B)	Sulphur Yellow	April-May	Medium
***	Elspeth Slocock (B)	Scarlet Bud, fades Apricot	April-May	Medium
***	Goldsworth Yellow (B)	Apricot	May	Medium
***	Lady Primrose (B)	Lemon Yellow, Red Spots	May	Medium
***	Mrs. W. C. Slocock (B)	Apricot Pink, shades to Yellow	May	Medium
****	Penjerrick (C)	Creamy Yellow	April-May	Medium
***	Souv. of W. C. Slocock (B)	Primrose	May	Medium
****	Unique (Slocock) (B)	Pale Yellow	April-May	Low
<i>Lavender-Purple</i>				
***	Blue Peter (A)	Pale Lavender	May	Medium
***	Purple Splendor (B)	Deep Purple	May	Medium
***	Susan (B)	Lavender	May	Medium

*Rhododendrons and azalea varieties recommended for Pacific Northwest Gardens.

Azaleas

D—Deciduous E—Evergreen

Rating	Name	Color	Blooming Period	Height	Type of Flower
*	Anthony Koster (D)	Rich yellow	April	3-4 ft.	Cluster
Good	Apple Blossom (E)	Pink and white	May	2-3 ft.	Small, Single
Good	Arnoldiana (E)	Light red	May	3-4 ft.	Single
Good	Balsaminaeflorum (E)	Light Coral	May	1-2 ft.	Double
Good	Benigiri (E)	Rose Cerise	May	3-4 ft.	Single
*	Daviesii (D)	Ivory	May	3-4 ft.	Cluster, Tubular
Good	Daybreak (E)	Silver Pink	May	2-3 ft.	Small, Single
**	Exquisita (Occid) (D)	Pink and White	May	3-4 ft.	Cluster
Good	Gandavense Rosea (E)	Lavender	May	4-5 ft.	Large, Single
**	Graciosa (Occid) (D)	Creamy Pink	May	3-4 ft.	Cluster
**	Gumpo (E)	White	May	12-18 in.	Single
**	Gumpo Red (E)	Red	May	2-3 ft.	Single
**	Hinomayo (E)	Soft Pink	April	2-3 ft.	Small, Single
*	Irene Koster (D)	Pink	May	3-4 ft.	Cluster
Good	J. T. Lovett (Indicum) (E)	Rose-Red	June	2-3 ft.	Single
*	Mars (E)	Red	April	3-4 ft.	Single
*	Nancy Waterer (D)	Yellow	May	3-4 ft.	Cluster
*	Narcissiflora (D)	Lemon Yellow	May	4-5 ft.	Tubular
*	Pallas (D)	Orange-Red	May	3-4 ft.	Tubular
Good	Peachblow (E)	Pale Pink	April	3-4 ft.	Single, Medium
**	Pink Gumpo (E)	Soft Pink	May	2-3 ft.	Large, Single
Good	Pink Pearl (E)	Soft Pink	April	2-3 ft.	Hose in Hose
**	Pulchrum-Maxwelli (E)	Light Red	May	3-4 ft.	Single
*	Ruby (E)	Red	April	3-4 ft.	Single
Good	Sekidera (E)	White, Crimson Blotch	May	3-4 ft.	Large, Single
Good	Snow (E)	White	May	3-4 ft.	Hose in Hose
**	Unique (D)	Orange-Yellow	May	3-4 ft.	Cluster
Good	White April (E)	White	May	2-3 ft.	Large, Single
**	Yodogawa (D)	Mauve Pink	May	4-5 ft.	Double

D. D. T. Kills Birds*

By D. B. TURNER

THE following article is based on a news item issued by the Audubon Society to call attention to another reason for caution in the indiscriminate use of the new insecticide.

Proof that D. D. T. (Dichlorodiphenyltrichloroethane) can and does kill birds was given this summer when the toxic chemical was sprayed over an area (near Wilkes-Barre and Scranton, Pennsylvania) infested with gypsy moth. Within 48 hours after an airplane had sprayed the area, the woods went "dead" without a sign of normal bird-life or song. All the dying birds that were picked up showed the same symptoms: a gradual paralysis of their muscles and an inability to move their wings except through a small arc. They kept up an almost constant fluttering of their wings until they died. The oft-repeated statement that D. D. T. is harmless to all warm-blooded organisms was thus proved false, the scientist in charge states.

The bird study was carried out by Dr. Neil

Hotchkiss of the United States Fish and Wildlife Service. He selected a 40-acre block in the area to be treated with D. D. T. and spent three weeks counting and mapping the bird population. His surveys showed 19 species and 64 pairs of birds in the tract at the time the spraying started. Two of male towhees, a male yellow-throat, and a nesting pair of sharp-shinned hawks were seen alive after the D. D. T. treatment. Among the dead, dying and missing were 21 pairs of ovenbirds, 14 pairs of red-eyed vireos, 4 pairs each of red-starts, towhees, and black-and-white warblers, and lesser numbers of chickadees, tanagers, buntings, flycatchers, woodpeckers and other warblers. In a similar 40-acre block nearby, laid out as a check area, the resident bird population showed no change during and after the experiment.

Gardeners who are searching for broad-leaved evergreen trees to replace Madrona might consider such worthy species as *Umbellularia californica*, *Castanopsis chrysophylla*, *Arbutus Unedo*, and several oaks such as *Q. agrifolia*, *Q. acuta*, and *Q. chrysolepis*.

*The above information was taken from the Summer, 1945, Issue of the Cornell Plantations Bulletin.

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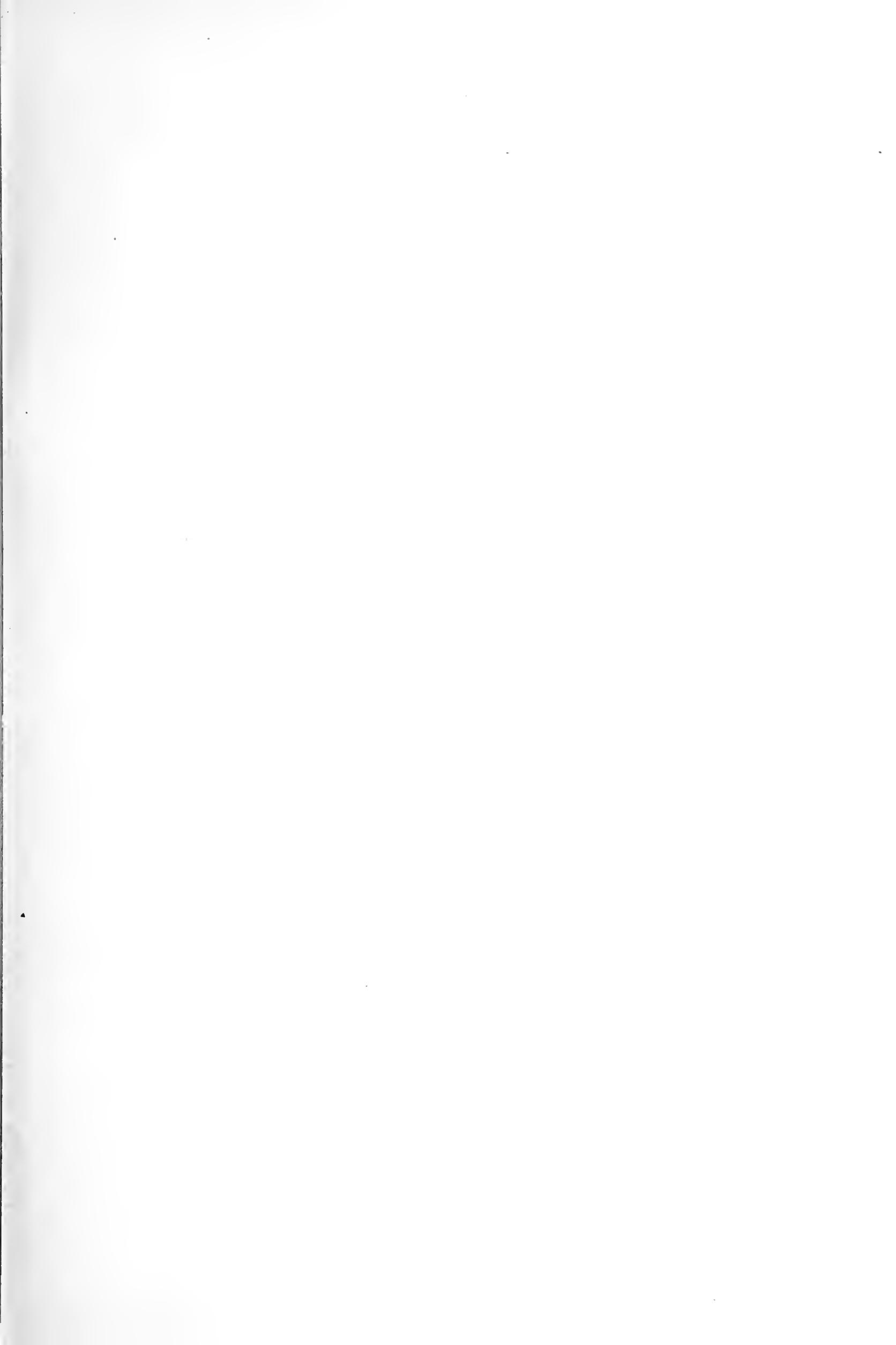
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